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ABSTRACT

A study evaluated a teacher development model that provides teachers with peer support and techniques for fostering active reading strategies in inner-city reading disabled adolescents using Collaborative Strategy Instruction. Subjects were 13 pairs of teachers in 9 middle, junior high, or senior high schools who taught reading comprehension to small pull-out groups of 3 to 10 students for 2 half-hour sessions per week for at least 4 months. Only teachers in the experimental group received training and participated in collaborative strategy instruction sessions with their students. Instructional sessions were videotaped before and after intervention, students were administered different versions of a standardized test as pre- and posttest, and teachers completed questionnaires. Results indicated that: (1) high school classes showed more gains than middle school for both the experimental and control groups; (2) the amount of training time was more critical than the amount of time the teachers spent working with students; (3) the goal of helping teachers and students work collaboratively during reading instruction was the focus of training and was reflected in teacher and student performance; (4) standardized test results were mixed; and (5) experimental teachers provided more reflective, comprehensive, and detailed responses on the questionnaire than controls. Findings suggest that teachers were able to help their students to productively make use of their basic problem solving and social capabilities by collaboratively generating, sharing, and evaluating strategies that allow them to understand text. (One table of data is included.) (RS)

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Cognitive Empathy: A Crucial Element in Collaborative Strategy Generation

Valerie Anderson and Marsha Roit

Objectives and Perspectives

This study evaluates a teacher development model designed to provide teachers with peer support and techniques for fostering active reading strategies in inner-city reading disabled adolescents through an instructional methodology that we have called Collaborative Strategy Instruction. The research builds on previous research with teachers (Anderson & Roit, 1990), but differs in that it involves more teachers and students for a longer period of time, employs teacher and student selected materials, and includes more extensive and refined analyses. As was the case in our previous research, this study attempts to show the direct links between changes in teacher behavior and changes in student reading performance.

Support for the teaching of reading strategies has grown over the last ten years, with numerous studies showing its effectiveness (e.g., Palinscar & Brown, 1984; Duffy, et al., 1987). It is not without its critics (e.g., Poplin, 1988), however, and recent efforts have focused on identifying those characteristics that make it most effective (Pressley, Goodchild, Fleet, Zajchowski, & Evans; Rosenshine & Chapman, 1991; Rosenshine & Meister, 1991; Dole, Duffy, Roehler, & Pearson, 1991).

Instruction for students in our research incorporates many effective aspects of strategy instruction, such as group collaboration, opportunistic teaching, reading as problem solving, flexible strategy use, and strategy combining. The instruction is unique among approaches to strategy instruction in that, while most strategy instruction provides teachers with prescribed strategies to pass on to their students, collaborative strategy instruction also includes a strong emphasis on helping students to access, evaluate, and re-align their existing reading strategies. For adolescents who have had considerable experience in trying and failing to learn to read, we feel that it is crucial for a method to show respect for their past as well as their ongoing cognitive efforts. Further, making use of students' existing abilities has long been recognized as a way to make new learning more meaningful. Throughout instruction, students are encouraged to generate their own strategies rather than simply to replicate those of their teachers.

To access students' strategies, we employ a powerful technique called "cognitive empathy." This is a means by which teachers collaborate with students to opportunistically access existing strategic knowledge and bring it to bear on reading. Throughout instruction, students are encouraged to view reading problems positively, as problem solving opportunities. As students become more open about problems, the teachers are taught to recognize and capitalize on signs from the students that suggest an awareness of problems and efforts to solve them are going on in their minds. Students indicate this by remarks, but also with furrowed brows, pauses, puzzled looks, and even short intakes of breath. Teachers use cognitive empathy to pick up on these reactions--to catch the moment when strategic thinking occurs--and to encourage students to make thoughts public by asking them questions like, What's on your mind? You seem to be thinking about something what are you trying to figure out? How are you going about it? How can we help? As a collaborative member of the reading group, the teacher might also introduce strategies of his/her own by think aloud modelling of the accessing of those strategies. When a problem occurs in reading, a variety of strategies are accessed in this way and the teacher and students collaborate in evaluating which strategy is most effective for a particular problem with a particular text. Thus, the use of students' strategies and the consideration of alternative strategies for solving the wide variety of reading problems that occur across differing text conditions also make this approach to strategy instruction unique.

The teacher's role in this instruction is collaborative rather than directive. In a parallel fashion, the teacher development model features teacher/researcher collaboration rather than researcher directiveness. Research by Stallings (1989) supports self evaluation by teachers. The present model makes use of self-

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evaluative techniques and problem solving sessions that mirror those that occur among teachers and students. Teachers experienced in the approach are available to offer assistance to new teachers, thus providing peer support to further strengthen the model.

Method

Participants. Initially, nine previously trained teachers recruited pairs of teachers from their schools to take part in the study. Thirteen pairs of teachers in nine middle, junior high, or senior high schools volunteered. Pairs were randomly assigned to the experimental or control group so that both conditions co-existed in the same schools. During the course of the study, two controls dropped out, leaving 13 experimental and 11 control teachers who provided data for the research. Students in the study were those with learning and reading problems ordinarily taught in small pull out groups (from three to ten students) by the teachers. The recruiting teachers provided peer support for one or more experimental teachers in their schools.

Instructional setting. The small group reading session, in which the teacher and students read aloud and attempt to understand a text, was the instructional situation for the study. At the start of the study, all teachers had experience in this setting, but none used it extensively. In this study, middle/junior high school teachers and students engaged in two half hour sessions a week for a period of six months, high school participants (due to the semester system) for four months.

Materials. Teachers were asked to decide or let students decide on the texts to be used in the sessions. Both fictional and non-fictional texts were used.

Pretest. For baseline information on how reading sessions were carried out, each teacher was videotaped for a half hour with his/her students. Teachers selected a slightly challenging passage for this session. All teachers administered the Stanford Diagnostic Reading Test to their students.

Teacher development. Experimental and control treatments were similar in that all teachers were to attempt to explicitly teach reading comprehension for the same number of sessions. Only experimental teachers received training and participated in collaborative strategy instruction sessions with their students.

Teacher development for the experimental group involved four afternoon sessions of three hours each, distributed evenly across the course of the study with application involving their own students throughout. Thus, what the teachers learned in the training sessions was applied directly to sessions with students. Experimental teachers were videotaped periodically, with segments of their videos used for self-evaluative purposes during the teacher development sessions.

Early in the sessions, teachers were presented with a set of twenty teacher shifts and twelve student shifts for use in evaluating their own teaching. The shifts represent changes that need to be made in order for more active reading to be fostered, e.g., a shift from focusing on right answers to focusing on how to arrive at answers, from teacher control of sessions to student/teacher collaboration, from ignoring reading errors to treating errors as problem solving opportunities, etc. This instrument first lists the ways in which teachers and students behave in remedial reading sessions, then provides a contrasting list of behaviors that characterize or promote active reading. Both typical and exemplary behaviors were drawn from earlier research on and observations of teachers working with reading groups. Throughout the training the teachers viewed their own teaching and evaluated it in the light of the shifts Also during the sessions, the teachers were provided with a set of principles and techniques for fostering active reading, with particular emphasis on empathizing with students' cognitions as described earlier. The teachers, also contributed techniques, keeping the basic principles for fostering active reading in mind.

Due to a major illness, the experimenter was unable to provide any additional guidance or support to experimental teachers beyond the four teacher development sessions. Therefore, the study essentially tests a maximum of twelve hours of ongoing training transmitted through a workshop format for the experimental teachers. Controls received similar training after the intervention was completed. Although it was hoped that peer support would involve instructional guidance for experimental teachers, support teachers played a largely organizational role (e.g, reminding teachers of meetings, suggesting materials, gathering tests, etc.). Thus, with control, experimental, and peer teachers in the same schools, organizational peer support tended to be the same for experimental and control teachers.

Posttest. Posttest videotapings of experimental and control teachers were similar to pretest except that different texts of the same genre were used (e.g., a teacher who was filmed with students reading a non-fictional text at pretest was filmed with students reading a different non-fictional text at posttest). A second form of the standardized test was administered by all teachers. Also, all teachers completed an extensive questionnaire designed to determine, among other things, how they taught, how it differed from their usual teaching, how they felt about the study, what they learned from the experience, and whether student learning that occurred during the reading sessions showed any signs of transfer.

Data Source

Data for the study consisted of transcriptions of pre and posttest videotapings, pre and posttest standardized test scores, and responses by teachers to the questionnaire given at the end of the intervention.

Analyses, Results, and Interpretations

Transcriptions of pre and post videotapings of experimental (13) and control (11) teachers. These analyses involve a study of each teacher who participated and each group of students that participated. Because the focus is on group collaboration, individual students are not studied. Each transcript was rated independently by two raters who had relevant instructional experience While one rater had been involved with the training and data collection, the second had no knowledge of the teachers, conditions, or time of videotaping. All transcriptions were rated using a 10 point Likert type scale to judge teachers and/or students on dimensions related to fostering active reading, collaboration, cognitive empathy, and specific teaching techniques. Teachers and students were rated separately on the same dimensions in 11 cases in order to determine whether teacher changes were "mirrored" or reflected in student changes. These dimensions are shown in the first eleven entries on Table 1. Teachers were rated separately on nine additional dimensions, shown in entries 12 through 20 of Table 1. Of particular importance is the dimension that measures teachers' accessing of students' strategies which is directly related to the "cognitive empathy" described earlier. Students were rated separately only on providing elaborated responses since it was desirable to show an increase in student verbalization in the sessions. In addition, raters checked to see if teachers helped students to engage in the following specific activities during the session: skimming, relating text to previously read material, reviewing previously read material, selecting difficult vocabulary, summarizing or explaining text, predicting, returning after reading to prereading goals and questions, and holding non-traditional and reflective post reading discussions.

Interrater reliability for the dimensions was examined by Pearson correlations. Results showed that raters were highly reliable with regard to which teachers and groups of students gained, lost, or stayed the same from pre to posttest on all dimensions (ranging from .74 to .95).

Using mean summary scores for all dimensions, a t test showed that summary scores were significantly higher for experimental teachers and students. In order to determine if the experimental effect was different for students at different grade levels (middle vs high school), a 2X2 ANOVA was performed. Results confirmed that the experimental condition was highly significant, $p < .001$, and that grade level was nearly significant, $p < .06$. High school classes showed more gains than middle school for both the

experimental and control groups, but it should be pointed out that high school students were considerably further delayed than middle school students in reading achievement at pretest. The interaction, however, was not significant, suggesting that the experimental effect was approximately the same at both middle and high school levels.

Correlations (for the experimental group only), between grade, number of student sessions, number of teacher training sessions, group size, grade level, and average summary gain were also completed. Only the number of training sessions that a teacher attended and average gain scores were significantly related on a 1 tailed test of significance ($p = .036$). This suggests that the amount of training time was more critical than the amount of time the teachers spent working with students.

Since an ANOVA revealed no significant interactions between condition and grade level on any of the dimensions, data for each of the dimensions was collapsed across grades for further analysis. The change score (posttest minus pretest score) for each dimension was examined by a t-test in order to assess the significance of the change. Mean scores on each dimension for experimental and control teachers and students are found in Table 1. The results showed significant changes for experimentals over controls ($p < .05$) on a majority of the dimensions. For some of the dimensions that showed little significance for experimental teachers and/or students, it was clear that both controls and experimentals were strong at both pre and posttest. Examples of these dimensions are remaining relevant to the text at hand, choosing appropriate materials, providing accurate information, and providing complete or intact texts. It would seem that these are aspects of good reading teaching that were common to both groups from the outset.

For 11 of the dimensions, it was predicted that teacher gains would be mirrored by concomitant gains by the students. There were significant gains for both teachers and students on 8 of these mirrored dimensions. In the case of the dimensions that involved relating text to prior knowledge and asking content free questions, the experimental teachers showed significant gains, but gains for the students were not found. It is interesting to note that while teachers encouraged students to ask questions, the questions students asked were directly related to specific content and not the more general questions that were encouraged during training. Since students have had years of experience with answering content related questions, it is not surprising that this sort of questioning was easiest for them. Likewise, bringing their prior content knowledge to bear on text was particularly difficult for these children. However, in fairness, other strategies received greater emphasis during training, which may explain this result. It is felt that a longer intervention with more support for teachers might strengthen these results.

In addition, experimental teachers encouraged a number of active reading techniques in students significantly more than controls ($p = .05$ or less). These included students' skimming before reading, choosing difficult words, predicting, and returning to prereading activities. Conducting discussions after reading that were not driven by typical content-inclusive, teacher-given questions approached significance ($p < .06$).

A factor analysis, based upon the intercorrelation of the gain scores with each of the student and teacher dimensions, was performed. Results indicated that a good deal of variance (48.4%) was accounted for by a single factor or dimension, that of treating reading problems openly. A number of other teacher and student dimensions appear to be measures of this one: modeling strategies, collaborating, focusing on learning about reading, and emphasizing learning over task. These, and others, may collectively form a main core of dimensions that reflect desired instructional changes better than others. A main goal of this research was to help teachers and students work collaboratively during reading instruction to identify reading problems, share strategies, and evaluate the effectiveness of those strategies for solving problems. Findings of the factor analysis strongly suggest that this goal was the focus of training and was reflected in teacher and student performance.

Standardized test results. It should be stressed that the authors do not feel that standardized test results can adequately reflect the goals and outcomes of strategy instruction. Standardized testing is done in this research primarily at the request of the participating schools. Results of this testing are mixed. It involves a smaller sample of students than the videotapings because some students were absent at pretest, others at posttest, and others did not complete the entire test. The analysis is based on those students who were present for and completed both tests. These students were tested on the decoding, structural analysis, vocabulary, reading comprehension, and reading rate subtests of the Stanford. There were consistent trends in favor of the experimental group. The middle school experimental group did significantly better than controls on vocabulary and total test scores. All other test scores were non-significant for that group. High school experimental students did significantly better on reading rate only, while the controls did significantly better on decoding. All other test scores were nonsignificant. It is difficult to interpret these results, particularly with regard to why the controls did so well. (both groups made unexpected gains on all tests). One explanation may be that the control teachers completed far more teaching sessions than the experimentals, often maintaining that they taught reading every day. The teaching that they did may have been more closely related to the kind of traditional skills that are reflected on a standardized test. It is probably more important to note that the experimentals did equally well when their instruction did not have such a focus.

Qualitative analyses of teacher post-intervention questionnaires. The questionnaire elicited teacher information about their students, the sessions, student/teacher reactions to sessions, and the type of materials used. Of particular interest were teacher responses to questions related to learning and transfer. In general, experimental teachers provided more reflective, comprehensive, and detailed responses than controls. Relevant questionnaire items and findings follow:

1. Have you related reading sessions to other classwork?

Almost all teachers maintained that they did this. Control teachers, however, offered only the names of general content areas as evidence; experimental teachers identified specific strategies and how they were applied to content areas.

2. Is there evidence that the reading sessions influence other schoolwork?

All teachers maintained that transfer occurred. Again, controls responded in generalities, while experimental teachers gave responses that were related to the process of reading, e.g., the students are more willing to take risks, the students realize that reading should make sense.

3. What specific teaching techniques were particularly helpful to students?

Control teachers were usually unable to describe their specific techniques, but one teacher mentioned phonics, another oral reading. As one might expect, experimental teachers described a wide variety of specific strategies, e.g., self questioning, visualization, skimming, syllabification, analyzing reading problems.

4. What have you (teacher) learned from the sessions?

Although teaching reading to small groups of students consistently over a substantial time period should result in some learning, control teachers rarely responded to this question, even after it was explained that it was not intended solely for experimental teachers. The experimental teachers provided a wide variety of specific information, as well as more general comments related to their own philosophies of teaching, e.g., reading can be a collaborative effort, one must listen and react to students, students can work without my guidance, text can be interesting to students. Such comments are of great importance in the light of the

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current emphasis on the necessity for changing teachers' models of reading and learning if enduring teacher change is to occur.

5. What have students learned from the sessions?

Few controls responded. Experimentals, however, expressed a wide variety of student learnings from specific reading skills and strategies to more general knowledge about reading, e.g., understanding the importance of reading for meaning, showing a willingness to help one another, realizing that having a problem in reading is okay.

6. List some advantages that these sessions had for your students.

Few controls responded. Experimentals noted a number of advantages, e.g., made problem solving the students' responsibility, focused on strategies that could be transferred to other subjects, created enthusiasm for reading, developed a team approach to learning, built confidence.

7. List some advantages that the sessions had for you as a teacher.

Again, few control responses. Experimental teachers felt that the sessions helped them to focus on making strategies more accessible to students, ask more appropriate types of questions, become more aware of teaching reading, observe students better, and make reading less threatening.

Overall, the teacher questionnaires showed that the experimental teachers were far more specific about reading in their responses than controls. Further, the experimental teachers indicated that their ideas about teaching changed considerably as a result of the study. They felt that they had changed as teachers and their students had changed as readers. The results of the pre-and posttest videotapes supported the teachers' beliefs.

Educational Significance

The educational significance of this research is clear because it is so practical and applied. It has strong implications for the teaching of both teachers and students. The study offers an effective approach to the reading problems of inner-city adolescent poor readers by building on a previously successful program, extending and refining it. The students in this study are "at risk." Such students are in danger of dropping out of school and becoming candidatesfor adult illiteracy unless something can be done in school to empower them with greater control over the reading and learning process. It is equally important to provide teachers with the means to provide such student empowerment. This research tests a unique approach to strategy instruction developed with teachers and students in real school settings. The study has helped teachers to enable their students to productively make use of their basic problem solving and social capabilities by collaboratively generating, sharing, and evaluating the strategies that will allow them to understand text. Underlying this collaboration, however, is a very basic empathy with and appreciation for the thinking that people engage in when they work together to understand text.

Table 1

Mirrored Shifts: Teachers and Students

	Shift Gain Scores (Pre- to Post-) on Teacher and Student Mirrored Shifts	Experimental (13) Mean %	 S.D.	Control (11) Mean %	 S.D.	t (df=22)	P
1.	T: Treats problems openly	6.12	2.78	-0.27	1.52	6.80	<0.001
	S: Treats problems openly	5.00	3.32	-0.05	0.93	4.87	<0.001
2.	T: Focuses on how to solve problems	5.27	3.23	-0.91	2.02	5.49	<0.001
	S: Focuses on how to solve problems	4.58	3.35	-0.09	0.86	4.48	<0.001
3.	T: Asks content free questions	5.46	2.98	-1.57	3.53	5.35	<0.001
	S: Asks content free questions	0.85	2.14	-0.32	1.05	1.64	[ns]
4.	T: Relates text to knowledge	3.98	3.09	0.77	3.94	2.22	<0.05
	S: Relates text to knowledge	4.65	3.31	1.64	4.26	1.96	[ns 0.07]
5.	T: Models reading strategies	4.77	3.08	-1.09	1.61	5.68	<0.001
	S: Expresses reading strategies	2.58	2.91	-0.18	0.46	3.10	<0.01
6.	T: Collaboration	4.27	3.24	-0.14	1.53	4.12	<0.001
	S: Collaboration	3.65	3.37	-0.01	1.51	3.40	<0.01
7.	T: Handles problems during reading	6.19	3.32	-1.09	1.96	6.38	<0.001
	S: Handles problems during reading	5.61	3.35	-0.50	1.07	5.05	<0.001
8.	T: Focuses on learning about reading	4.00	3.32	-0.64	2.12	3.99	<0.001
	S: Focuses on learning about reading	3.50	3.81	0.09	1.63	2.75	<0.05
9.	T: Emphasizes learning over tasks	5.73	2.79	-0.59	2.19	6.07	<0.001
	S: Emphasizes learning over tasks	4.81	3.05	-0.27	1.75	4.87	<0.001
10.	T: Remains text relevant	1.23	1.70	-1.41	2.83	2.82	<0.05
	S: Remains text relevant	1.50	2.02	-1.22	2.97	2.67	<0.05
11.	T: Actively involved in reading session	0.50	0.98	-1.05	2.58	2.00	[ns]
	S: Actively involved in reading session	0.92	1.64	0.45	3.24	0.46	[ns]

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Table 1 (Continued)

Non-Mirrored Shifts: Teachers and Students

	Shift Gain Scores (Pre- to Post-) on Teacher and Student Shifts	Experimental (13) Mean %	 S.D.	Control (11) Mean %	 S.D.	t (df=22)	P
12.	T: Encourages student questions	1.58	2.07	-0.45	2.58	2.15	<0.05
13.	T: Encourages students' taking of responsibility	4.50	3.19	-0.18	0.64	4.77	<0.001
14.	T: Informs students	4.62	2.94	1.59	2.07	5.88	<0.001
15	T: Values differing responses	4.04	3.02	0.18	4.50	2.50	<0.05
16.	T: Selects appropriate materials	2.04	2.67	0.14	3.38	1.54	[ns]
17.	T: Provides accurate information	1.15	2.26	-1.14	3.76	1.84	[ns 0.10]
18.	T: Encourages reading aloud	2.96	3.90	-0.91	3.07	2.66	<0.05
19.	T: Provides complete text	1.31	2.51	0.77	3.64	0.42	[ns]
20.	T: Accesses students' strategies	4.15	3.66	-0.14	0.45	3.64	<0.05
21.	S: Provides elaborated commentary	3.54	3.11	1.23	3.45	1.73	[ns 0.10]

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